Guild of Architectural Ironmongers

# GAI GUIDES TO STANDARDS

## BS EN 1906:2012

Lever handles and knob furniture

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## GAI GUIDE TO STANDARDS

This Guide is one of a series of "GAI Guides to Standards" which the Guild of Architectural Ironmongers have published relating to British or European Standards which are relevant to the architectural ironmongery industry. They highlight background and detail on the relevant product, provide information on the specific standard and explain what harmonisation or designation is, where applicable. This GAI Guide relates to lever handles and knob furniture.

### Definition

The following definitions are taken directly from EN 1906:

- **Door furniture:** combination of lever handles or knobs on backplates or roses for the purpose of operating locks or latches.
- **Door knob:** fixed or rotatable operating element, usually designed to be circular in plan...which engages a spindle passing through a door and operating then a latch mechanism when rotated, so that the latch bolt is withdrawn to unlatch the door.
- **Door lever handle:** rotatable operating element designed as a lever with a length from its axis of rotation to its free end that exceeds 75mm, and which engages a spindle passing through a door.
- **Escutcheon:** A surround with a shaped hole to accommodate a key or a lock cylinder with or without a pivoted cover plate, intended primarily to remain operable after a fire. A door handle can also be defined as an attached object or mechanism used to manually open or close a door

### History and etymology

An American inventor named Osbourn Dorsey has been attributed with inventing the modern day door-knob. He filed a submission for this with the U.S. patent office in 1878. Prior to this people secured their houses with a simple technology called a latch-string. This involved boring a small hole in the door, then inserting a looped piece of cord or leather thong around a bar which was used to fasten the door from inside the door.

BS EN 1906 was first published in May 2010, but was revised on 31st August 2012.

The word handle is derived from the Old English verb handlian used prior to 900 A.D. and from the Old Norse handla meaning to seize. The word escutcheon is from the Old North French word escuchon which is from the Latin word scūtum meaning shield.

**"Humour can get in under the door while seriousness is still fumbling at the handle."**

G.K. Chesterton

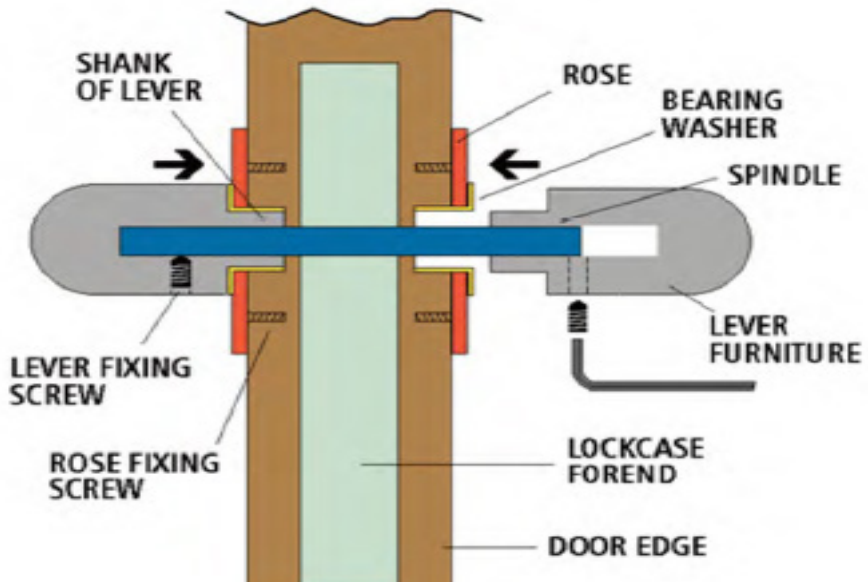
## What does the term door furniture mean?

Door Furniture is a term in general use meaning handles that operate the wide variety of locks and latches in today's market place. The locks could be either mortice (let into leading edge of the door) or rim (surface mounted). The furniture has to suit the type of lock specified. Upright mortice locks usually require lever handles. Knobs might be used on upright locks with deeper backsets, or on horizontal locks, to ensure the user will not 'rap' their knuckles against the door frame whilst operating the knob.

It's rare to specify knobs on commercial contracts these days, due to the introduction of the Equality Act 2010, as well as BS 8300 accessibility standards: Public buildings and workplaces must be accessible to people with disabilities, and knobs can pose problems for many users, because of the need to both grip and twist. A lever can often be operated by a closed fist, or even an elbow, making its operation much easier for many people BS 8300 2 states "it should be possible to operate all door opening furniture one-handed. Without the need to grasp or twist" It also states "Wherever possible, door opening furniture used in conjunction with locks and latches should have a lever action. Knobs with a spherical, circular or similar design... are difficult to use by people with limited dexterity, arthritis or a weak grip.

## Diagram of a set of handles

Here is a diagram showing a cross-section of a set of handles, detailing the relevant parts:



## The standard - BS EN 1906:2012 Lever handles and knob furniture

### Scope:

The European standard specifies the performance requirements and test methods (i.e. durability, static strength, operating torque, corrosion, safety, etc.) for sprung and unsprung lever handles and knobs for doors on backplates or roses. It applies only to lever handles and knobs that operate a lock or latch. The standard has 4 grades of performance. Compliance with the standard ensures a margin of strength in excess of that needed for normal operation. The standard has additional graded safety requirements where a high risk of failing exists.

### Classification:

Almost all European architectural hardware standards follow a common format to help ease their understanding by users. Each product is classified under a number of performance headings and, generally, these are the same for all products. All products are "marked" with a six or more digit classification coding which shows, in fine detail, just what levels of product performance are being claimed for the item. The classification system when applied to all items of architectural hardware, will enable complementary items all to be specified to, for instance, a common level of corrosion resistance, category of use, door mass, etc.. This standard classifies cylinders using an 8 digit coding

### Example:

The following marking denotes a lever handle for use on a door that has a high frequency of use and is subject to frequent violent use. It may be suitable for use on fire door assemblies and for use where safety is important. It has a very high corrosion resistance and a high burglary resistance suitable for external doors. It is of the unsprung type.

| 4 | 7 | - | 1 | 1 | 4 | 3 | U |
|---|---|---|---|---|---|---|---|

## Classification - BS EN 1303:2015 Cylinders for locks

### Digit 1 – Category of use

- Grade 1: medium frequency of use with a high incentive to exercise care and a small chance of misuse e.g. internal residential doors;
- Grade 2: medium use by people with some incentive to exercise care but where there is some chance of misuse e.g. internal office doors;
- Grade 3: high use by public or others with little incentive to exercise care and with a high chance of misuse e.g. public office doors;
- Grade 4: high use on doors which are subject to frequent violent use

### Digit 3 – Door mass

No requirement.

### Digit 5 – Safety

- Grade 0 : normal use
- Grade 1: safety application – to qualify for this grade, handles must have high strength handle to-plate and plate-to-door fixing and/ or handle to-spindle fixing, such that they would withstand a person grabbing in order to prevent falling. It is recommended that only Safety Grade 1 furniture is used at the top of cellar steps or other staircases.

### Digit 7 - Security

- Grade 0 : not approved for use on burglary resistant doors
- Grade 1: mild burglary resistance.
- Grade 2: moderate burglary resistance.
- Grade 3: high burglary resistance.
- Grade 4: extra high burglary resistance.

| 4 | 7 | - | 1 | 1 | 4 | 3 | U |
|---|---|---|---|---|---|---|---|

### Digit 2 – Number of test cycles

- Grade 6: medium use – 100,000 cycles
- Grade 7: high use – 200,000 cycles.

The tests undertaken to achieve these grades involve the application of additional forces to the door furniture in order to simulate the conditions of use likely to be experienced in the field.

### Digit 4 – Fire behaviour

Five grades of fire resistance are identified and shall receive the extension "1" for an optional door cycle test:-

- Grade 0: no performance determined;
- Grade A: for use on smoke-control doors;
- Grade A1: for use on smoke-control doors, tested with 200,000 cycles on a test door;
- Grade B: for use on smoke-control and fire-resistant doors;
- Grade B1: for use on smoke-control and fire-resistant doors, tested with 200 000 cycles on a test door;
- Grade C: for use on smoke-control and fire-resistant doors with requirements for fire protection inlays in backplate, rose and escutcheon;
- Grade C1: for use on smoke-control and fire-resistant doors with requirements for fire protection inlays in backplate, rose and escutcheon, tested with 200,000 cycles on a test door

### Digit 6 – Corrosion resistance

- Grade 0: no defined corrosion resistance
- Grade 1: mild resistance – minimum requirement for internal use
- Grade 2: moderate resistance
- Grade 3: high resistance – minimum requirement for external use
- Grade 4: very high resistance for use in exposed marine atmospheres or very polluted industrial environments.
- Grade 5: extremely high resistance

Note: Products intended to develop a natural patina (such as bronze or brass) are not required to comply with any requirements.

### Digit 8 – Attack resistance

Three operation types are identified:-

- Type A: spring assisted furniture
- Type B: spring loaded furniture
- Type U: unsprung furniture

## BS 8300 2 and accessibility

This standard covers the design of buildings to meet the needs of disabled people. It gives recommendations for dimensions of lever furniture, to ensure that it is usable by people with a variety of disabilities. In this standard you will find the key dimensions represented on a variety of shapes of lever furniture. It is often said that only round bar, return-to-door levers are allowed but this is incorrect. Any design with a cross-section of around 19 mm which meets the other dimensional requirements is acceptable. If lever furniture is to be used in public buildings on the defined Access Route through the building, then those levers should correspond with the dimensions in the standard as closely as possible. The standard is guidance, not mandatory.

Another recommendation of the standard is that lock centres should be at least 72 mm, or the keyway should be above the lever. These options achieve two goals:

- It gives a clear view of the keyway (it's not hidden just under the lever)
- It gives better access, with less likelihood of fingers banging into the lever whilst manipulating the key.

A GAI Guide to BS 8300 is also available with further information on this Standard.

## Specification issues

Security – Security lock furniture is one element of a burglary resistant door assembly that includes the door leaf and frame, lock, hinges and the method of fixing. Main design requirements include the use of at least two through-door fixings which cannot be detached from the outside. Requirements also include the use of an internal plate with a cylinder aperture that closely matches the cylinder profile and that the cylinder does not project more than 3mm from the face of the plate. Springing – It is essential to select the correct type of lock/latch to suit the associated furniture.

Type A furniture has light springing only and is dependent on the lock/latch springing to fully return the lever to the "at rest" position.

Type B furniture has integral springing capable of returning the lever to its rest position

Type U is dependent wholly on the lock/latch to return it to its rest position.

Application – It is most important to specify the correct grade of door furniture for the intended application. For example, Category of Use Grade 1 levers are most suited for light residential use, whereas Grade 4 door furniture is the most appropriate choice for buildings such as schools and sports stadiums where there will be a high level of use, and possible abuse.

## Related standards

- BS EN 12209:2003 and 2016 Building hardware. Locks and latches. Mechanically operated locks, latches and locking plates. Requirements and test methods
- BS 8300-2:2018 Design of an accessible and inclusive built environment. Buildings. Code of practice
- BS EN 1303: 1998 Cylinders for Locks
- BS EN 1670: Corrosion Resistance
- BS EN 1634-1:Fire Resistance Tests for door and shutter assemblies

## Fire door assemblies

Lock and latch furniture for use on fire/smoke doors should comply with appropriate requirements of the European standard.

In addition:- For lock and latch furniture to be attested suitable for use on fire/ smoke door assemblies, a third set of lock or latch furniture should be incorporated in a door assembly that has satisfied the criteria of a fire test according to BS EN 1634-1.

This furniture should be fitted on to identical design, shape, and size of door assemblies compliant with specific fire test requirements.

## UKCA/CE/UKNI Marking

BS EN 1906 has not been designated as a harmonised product standard under the Construction Products Regulation in EU or designated standard and therefore CE/ UKCA/UKNI marking of product to this standard is not permitted.

## Claims of conformity

Conformity to the standard must be clearly and unequivocally stated. Such phrases as "tested to ...","designed to conform to ...", "approved to ...", are not sufficient. To avoid misleading or confusing claims it is recommended that one of the following phrases is used when stating conformity:

- This product has been successfully type-tested for conformity to all of the requirements of BS EN 1906 test reports and/or certificates are available upon request.
- This product has been successfully type-tested for conformity to all of the requirements of BS EN 1906 including the additional requirements for fire/smoke door use*. Test reports and/or certificates are available upon request. *Add as appropriate.
- This product has been successfully type-tested for conformity to all of the requirements of BS EN 1906 including the additional requirements for fire/smoke door use*. Regular audit testing is undertaken. Test reports and/or certificates are available upon request.*Add as appropriate.
- As it is important that a producer is extremely careful about the accuracy of the claims it makes, so it is important for ironmongery specifiers to be equally vigilant in ensuring that they ask for, and receive, copies of the Test Certification and Declaration of Performance.

## GAI Specifiers' Guides

GAI have now published a set of Specifiers Guides relating to ironmongery and access control product for the Construction industry. These are aimed at assisting all who are involved in the specification process from the architect, architectural technician, interior designer, M&E consultant right through to the specifying architectural ironmonger. There are ten titles as follows:

- Ironmongery, fire doors and intumescent protection (NEW)
- UKCA Marking
- Ironmongery in a post pandemic world
- Ironmongery and the impact of the Internet of Things
- Ironmongery and security (endorsed by Secured by Design)
- Ironmongery and accessibility
- Ironmongery for fire and escape doors
- Ironmongery for specialist applications
- The specification of access control
- Ironmongery and the impact of the environment

## GAI Guides to Standards

The GAI have an extensive library of Guides to Standards. These Guides provide information not just on the Standard itself but also some background on the relevant product. The following is a list of the standards on which the Guides are based:

- GAI Introduction to Standards
- BS EN 1154
- BS EN 1155
- BS EN 1125
- BS EN 179
- BS EN 1303
- BS EN 1906
- BS EN 1935
- BS EN 16005
- BS EN 13637
- BS EN 12209 (2003 and 2016)
- BS 3621/8621/10621
- BS 8300 1&2
- BS 8613
- GAI Guide to doorset standards
- GAI Guide to BIM Standards
- BS EN 1158
- BS EN 14846
- BS EN 1527

## GAI RIBA Approved CPDs

The GAI have eleven CPD presentations which have been approved by RIBA and are all available to member companies to purchase and deliver to their architects and specifiers. As these have been approved by RIBA they are all worth double points to RIBA members. For further information please see here

The following is a list of each CPD presentation:

- Ironmongery, fire doors and intumescent protection (NEW)
- Ironmongery specification in a COVID-19 world
- Ironmongery and the impact of the Internet of Things
- Ironmongery and the Environment
- Specifiers guide to Access Control
- Ironmongery for fire and escape doors
- Architects Guide to door hardware
- Ironmongery and accessibility
- Ironmongery and security
- Ironmongery and specialist applications
- Installation of fire doors and associated ironmongery

## Code of Practice: Hardware for fire and escape doors

Further information on the correct selection of items of ironmongery for use on all fire resisting and escape route doors can be found in the "Code of Practice: Hardware for fire and escape doors" this is available on the GAI website www.gai.org.uk or www.firecode.org.uk.

## About the GAI

The Guild of Architectural Ironmongers (GAI is the only trade body in the UK that represents the interests of the whole architectural ironmongery industry - architectural ironmongers, wholesalers and manufacturers. Its reputation is built on three key areas: education, technical support and community.

Its qualifications, education and CPD programmes are widely respected in the UK and overseas, including the GCC and Hong Kong. Its technical information service is the only specialist service of its kind, providing GAI members with comprehensive advice on issues relating to the legislation, regulations and standards governing the use of architectural ironmongery and related hardware.

## Bibliography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